

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference WN-2673P	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/JP2004/010538	International filing date (day/month/year) 16.07.2004	Priority date (day/month/year) 16.07.2003
International Patent Classification (IPC) or national classification and IPC H04J15/00		
Applicant NEC Corporation		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of _____ sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

- a. ☒ (sent to the applicant and to the International Bureau) a total of **4** sheets, as follows:
- ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
- ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____

_____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the report
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/010538

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
 - ☐ publication of the international application (Rule 12.4)
 - ☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☐ the international application as originally filed/furnished
- ☒ the description:

pages 1-18 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

- ☒ the claims:
- nos. 7-16, 18-27 as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* _____ received by this Authority on _____

nos.* _____ received by this Authority on _____

- ☒ the drawings:
- sheets 1-8 as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☒ the claims, nos. 1-6, 17, 28

☐ the drawings, sheets/figs _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing (*specify*): _____

☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/010538

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	7-16, 18-27	YES
	Claims		NO
Inventive step (IS)	Claims	10, 15, 21, 23-27	YES
	Claims	7-9, 11-14, 16, 18-20, 22	NO
Industrial applicability (IA)	Claims	7-16, 18-27	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
<p>Document 1: Genjun To, Katsuo Mori, Hideo Kobayashi, "MIMO 'channel' ni okero tekiou wo mochiita SDM-OFDM 'system'", Denshi Hoku Tsushin Gakkai Gijutsu Kenkyu Hokoku, Vol. 103, No. 66, 23 May 2003, pp. 75-82</p> <p>Document 2: WO 2002/073916 A (Matsushita Electric Industrial Co., Ltd.), 19 September 2002; page 2, line 16 to page 3, line 25</p> <p>Document 3: WO 2003/050968 A1 (Qualcom Incorporated), 19 June 2003; paragraph [1045]</p> <p>Document 4: WO 2003/041300 A1 (Qualcom Incorporated), 15 May 2003; paragraphs [1221]-[1232]</p> <p>Document 5: K. Miyashita, H. Nishimura, T. Okane, K Ogawa, Y. Takatori, "MIMO 'channel' ni okeru koyuu 'beam' kuukan bunkatsu tajuu (E-SDM) houshiki" Denshi Hoku Tsushin Gakkai Gijutsu Kenkyu Hokoku, Vol. 102, No. 86, 24 May 2002, pp. 13-18</p> <p>The inventions set forth in claims 7, 11, 12 and 16 do not involve an inventive step in the light of document 1 and document 2, cited in the international search report.</p>			

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/010538

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

Document 1, cited in the international search report, discloses a signal transmission system which is a system having a plurality of signal transmission and reception antennae wherein a channel matrix is estimated, and feedback is performed by calculating a physical quantity for a demodulated pilot signal from the channel matrix and a vector estimated from the channel matrix; and the feedback information is used as the basis for applying suitable modulation to signal transmission.

The additional feature of deciding transmission parameters from a physical quantity calculated on the signal reception side, and transmitting the decided transmission parameters on the signal transmission side is known art (see, for example, document 2, page 2, lines 8-18).

Therefore, a person skilled in the art could easily apply said known art in the invention disclosed in document 1 to constitute the inventions set forth in claims 7, 11, 12 and 16.

The inventions set forth in claims 18 and 22 do not involve an inventive step in the light of document 1 and document 3, cited in the international search report.

Estimating channel information by transmitting a pilot signal from the signal reception side to the signal transmission side, when the signal channel matrix in which received signals are detected and the signal channel matrix in which the transmitting unit is detected are the same, is known art (for example document 4).

Therefore, a person skilled in the art could easily apply said known art in the invention disclosed in document 1 to constitute the inventions set forth in

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/010538

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

claims 18 and 22.

The inventions set forth in claims 8, 13 and 19 do not involve an inventive step in the light of documents 1-3, cited in the international search report.

SNR is a known physical quantity for evaluating wireless circuit quality (e.g. document 4); therefore use of SNR instead of CNR in document 1 is deemed to be a technical feature within the scope of design for a person skilled in the art.

In so doing, given that in document 1 signal power and noise power are detected on the basis solely of the channel matrix and a matrix calculated from the channel matrix, it is deemed that SNR can also be calculated on the basis of the channel matrix.

The inventions set forth in claims 9, 14 and 20 do not involve an inventive step in the light of documents 1-3, cited in the international search report.

Document 1 discloses calculation of a physical quantity on the basis of average signal power.

On further investigation, since average signal power is calculated by dividing total signal power by the number of signals, use of total signal power instead of average signal power is within the scope of design for a person skilled in the art.